AMENDMENTS TO THE CLAIMS

1. (original) An electric machine comprising:

a first coil group containing a plurality of coils arranged along a specified direction; and

a magnet group facing the first coil group and capable of moving relative to the first coil group along the specified direction;

wherein the first coil group is classified into M phase sub coil groups each constituted by n coils where M is an integer of 2 or more and n is an integer of 1 or more, and the coils of the sub coil groups are aligned in sequence one at a time with a specified sub coil group interval Dc from the first phase sub coil group to the M-th phase sub coil group along the specified direction,

the sub coil group interval Dc is set to a value of K/M times a magnetic pole pitch Pm (K is a positive integer excluding an integral multiple of M) where the magnetic pole pitch Pm is defined, in relation to the magnet group, to be a distance corresponding to an electrical angle of л along the specified direction,

the adjacent sub coil groups are driven at a phase difference of (K/M) л, and

each coil has substantially no magnetic material core.

2. (original) An electric machine according to claim 1, wherein

when the magnet group is seen from the first coil group side, N poles and S poles are arranged alternately along the specified direction, and the pitch between the N pole and the S pole is equal to the magnetic pole pitch Pm.

3. (original) An electric machine according to claim 1, wherein

when the magnet group is seen from the first coil group side, only a specified same one of the N pole and the S pole is repeatedly arranged along the specified direction, the pitch between the same poles is equal to 2 times the magnetic pole pitch Pm.

4. (currently amended) An electric machine according to ~~any one of claims 1 to 3~~ claim 1, further comprising:

a case for accommodating the first coil group and the magnet group,

wherein each coil is wound around a core formed from a substantially nonmagnetic and non-electroconductive material, and

the case is formed from a substantially nonmagnetic and non-electroconductive material.

5. (currently amended) An electric machine according to ~~any one of claims 1 to 4~~ claim 1, wherein

structural members with exception of shafts and bearings are formed from substantially nonmagnetic and non-electroconductive material.

6. (currently amended) An electric machine according to ~~any one of claims 1 to 5~~ claim 1, wherein

the integer K is an odd number, and

a coil count n of each sub coil group is 2 or greater, and the coils in the same sub coil group are interconnected in such a manner that adjacent coils belonging to the same sub coil group are always excited with mutually opposite polarities.

7. (currently amended) An electric machine according to ~~any one of claims 1 to 5~~ claim 1, wherein

the integer K is an even number, and

a coil count n of each sub coil group is 2 or greater, and the coils in the same sub coil group are interconnected in such a manner that adjacent coils belonging to the same sub coil group are always excited with a mutually identical polarity.

8. (currently amended) An electric machine according to ~~any one of claims 1 to 7~~ claim 1, further comprising:

a second coil group provided on a opposite side from the first coil group across the magnet group, a relative position of the second coil group to the first coil group being fixed,

wherein the second coil group has same coil arrangement as the first coil group, and

the m-th phase sub coil group (m is an integer from 1 to M) of the first coil group and the m-th phase sub coil group of the second coil group are arranged at opposing positions across the magnet group, and are always magnetized to a mutually identical polarity.

9. (currently amended) An electric machine according to ~~any one of claims 1 to 8~~ claim 1, further comprising:

a drive signal generating circuit for supplying M alternating current drive signals to the M phase sub coil groups,

wherein the drive signal generation circuit generates the M alternating current drive signals so that polarity of each coil in each sub coil group are switched when center of each coil is opposite to one of centers of the magnets in the magnet group, and that magnetic flux density in each sub coil group reaches a maximum value at a timing when midway points between two adjacent coils in the same phase sub coil group are opposite to the centers of the magnets in the magnet group.

10. (original) An electric machine according to claim 9, wherein

the drive signal generating circuit is capable of reversing an operating direction of the first coil group and the magnet group by reversing a current direction of each sub coil group.

11. (currently amended) An electric machine according to claim 9 ~~or claim 10~~, wherein

the drive signal generating circuit includes:

a PWM circuit for generating M PWM signals whose phases are mutually shifted by (K/M) л, and

a masking circuit for generating the M alternating current drive signals by masking the M PWM signals according to an output demand of the electric machine.

12. (original) An electric machine according to claim 11, wherein

the masking circuit masks each PWM signal in a temporal range that is symmetrically centered around a timing at which polarity of each alternating current drive signal is inverted.

13. (currently amended) An electric machine according to ~~any one of claims 9 to 12~~ claim 9, further comprising:

a regenerative circuit for regenerating electric power from the coil groups,

wherein the drive signal generation circuit and the regenerative circuit are capable of operating the electric machine in an operation mode in which a drive force is generated from at least one of the M sub coil groups while electric power is regenerated from at least one other sub coil group.